

What is claimed is:

1. A transmission direction switching device for a half-duplex communication apparatus, said
5 half-duplex communication apparatus including a universal asynchronous receiver transmitter (UART) and a half-duplex communication interface driver having a signal subtraction function and connected to said UART via a sending line and to said
10 transmission direction switching device via a direction control line; said transmission direction switching device comprising:

15 a data transmission detector coupled to said sending line for detecting any data to be sent and sending said data if such data exists; and

20 a direction-switching rule executor for receiving said data sent out by said data transmission detector, and sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said
25 data received from said data transmission detector is a signal 0 or a low signal, or sending a direction

switching device comprising:

a data transmission detector coupled to said sending
line for detecting any data to be sent and sending
said data if such data exists; and

a direction-switching rule executor for receiving
said data sent out by said data transmission detector
and generating a negative data in reverse to said
data received from said data transmission detector;
and said direction-switching rule executor sending
a direction switching signal via said direction
control line to said half-duplex communication
interface driver to set a transmission direction
of said half-duplex communication interface driver
to a sending direction when said negative data is
a signal 0 or a low signal, or sending a direction
switching signal via said direction control line
to said half-duplex communication interface driver
to set a transmission direction of said half-duplex
communication interface driver to a receiving
direction when said negative data is a signal 1 or
a high signal.

5. The transmission direction switching device as
claimed in claim 4, wherein said half-duplex

communication interface driver comprises a driver in compliance with RS485 standard.

6. The transmission direction switching device as claimed in claim 4, wherein said transmission direction switching device is a programmable logic device.

7. A method for switching transmission direction of a half-duplex communication apparatus, said half-duplex communication apparatus including a universal asynchronous receiver transmitter (UART), a half-duplex communication interface driver having a signal subtraction function, and a transmission direction switching device; said half-duplex communication interface driver being connected to said UART via a sending line and to said transmission direction switching device via a direction control line; and said transmission direction switching device including a data transmission detector and a direction-switching rule executor; said method comprising the steps of:

detecting any data transmission by using said data transmission detector coupled to said sending line to detect any data to be sent and sending said data

if such data exists; and

implementing transmission direction switching by
using said direction-switching rule executor to
5 receive said data sent by said data transmission
detector, such that said direction-switching rule
executor sends a direction switching signal via said
direction control line to said half-duplex
communication interface driver to set a transmission
10 direction of said half-duplex communication
interface driver to a sending direction when said
data received from said data transmission detector
is a signal 0 or a low signal, or sends a direction
switching signal via said direction control line
15 to said half-duplex communication interface driver
to set a transmission direction of said half-duplex
communication interface driver to a receiving
direction when said data received from said data
transmission detector is a signal 1 or a high signal.

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8. The method for switching transmission direction as
claimed in claim 7, wherein said half-duplex
communication interface driver comprises a driver
in compliance with RS485 standard.

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9. The method for switching transmission direction as

claimed in claim 7, wherein said transmission direction switching device is a programmable logic device.

5 10. A method for switching transmission direction of
a half-duplex communication apparatus, said
half-duplex communication apparatus including a
universal asynchronous receiver transmitter (UART),
a half-duplex communication interface driver having
10 a signal subtraction function, and a transmission
direction switching device; said half-duplex
communication interface driver being connected to
said UART via a sending line and to said transmission
direction switching device via a direction control
15 line; and said transmission direction switching
device including a data transmission detector and
a direction-switching rule executor; said method
comprising the steps of:

20 detecting any data transmission by using said data
transmission detector coupled to said sending line
to detect any data to be sent and sending said data
if such data exists; and
25 implementing transmission direction switching by
using said direction-switching rule executor to

receive said data sent by said data transmission
 detector and generate a negative data in reverse
 to said data received from said data transmission
 detector, such that said direction-switching rule
 5 executor sends a direction switching signal via said
 direction control line to said half-duplex
 communication interface driver to set a transmission
 direction of said half-duplex communication
 interface driver to a sending direction when said
 10 negative data is a signal 0 or a low signal, or sends
 a direction switching signal via said direction
 control line to said half-duplex communication
 interface driver to set a transmission direction
 of said half-duplex communication interface driver
 15 to a receiving direction when said negative data
 is a signal 1 or a high signal.

11. The method for switching transmission direction as
 claimed in claim 10, wherein said half-duplex
 20 communication interface driver comprises a driver
 in compliance with RS485 standard.

12. The method for switching transmission direction as
 claimed in claim 10, wherein said transmission
 25 direction switching device is a programmable logic
 device.